WHAT IS CLAIMED IS:

1. A semiconductor light-emitting device comprising an element having:

a semiconductor multilayer film containing a nitride and having an active layer; and

a transparent layer provided on the semiconductor multilayer film and having projections/depressions of a two-dimensional periodic structure at an upper surface thereof to diffract light from the active layer at the projections/depressions and guide the diffracted light to an outside of the semiconductor multilayer film.

2. The semiconductor light-emitting device of claim 1, wherein, when a distance between each of depressed portions of the projections/depressions and the active layer is D and a wavelength of the light from the active layer in the element is λ, $D \leq 5\lambda$ is satisfied.

3. The semiconductor light-emitting device of claim 1, wherein, when a period of the projections/depressions is L and a wavelength of the light from the active layer in the element is λ, $\lambda \leq L \leq 20\lambda$ is satisfied.

4. The semiconductor light-emitting device of claim 1, wherein, when a height of each of the projections/depressions is h and a wavelength of the light from the active layer in the element is λ, $h \leq 5\lambda$ is satisfied.

5. The semiconductor light-emitting device of claim 1, wherein the transparent layer is a first nitride semiconductor layer and an electrode layer is further provided on the first nitride semiconductor layer.

6. The semiconductor light-emitting device of claim 5, wherein an upper surface of the electrode layer is provided with projections/depressions reflecting the projections/depressions of the upper surface of the first nitride semiconductor layer.

7. The semiconductor light-emitting device of claim 5, wherein the electrode layer is a metal or a metal oxide having a film thickness of 50 nm or less.

8. The semiconductor light-emitting device of claim 5, wherein the electrode layer is an indium tin oxide.

9. The semiconductor light-emitting device of claim 1, wherein

the semiconductor multilayer film further has a nitride semiconductor layer of a first conductivity type provided on the active layer and a nitride semiconductor layer of a second conductivity type provided under the active layer and

the transparent layer has an electrode layer provided on the nitride semiconductor layer of the first conductivity type.

10. The semiconductor light-emitting device of claim 9, wherein an upper surface of the electrode layer is provided with the projections/depressions of a two-dimensional periodic structure.

11. The semiconductor light-emitting device of claim 9, wherein the transparent layer further has a layer provided on the electrode layer and having the projections/depressions of a two-dimensional periodic structure.

12. The semiconductor light-emitting device of claim 9, wherein the electrode layer is a metal or a metal oxide having a film thickness of 50 nm or less.

13. The semiconductor light-emitting device of claim 9, wherein the electrode layer is an indium tin oxide.

14. The semiconductor light-emitting device of claim 11, wherein the layer having the projections/depressions of a two-dimensional periodic structure is made of a resin.

15. The semiconductor light-emitting device of claim 14, wherein the projections/depressions are formed by pressing.

16. The semiconductor light-emitting device of claim 1, wherein each of projecting portions of the projections/depressions of the transparent layer has a flat upper surface.

17. A method for fabricating a semiconductor light-emitting device having a semiconductor multilayer film containing a nitride and having an active layer and a transparent layer provided on the semiconductor multilayer film, the method comprising the steps of:

(a) forming the transparent layer on the semiconductor multilayer film; and

(b) after the step (a), pressing an upper surface of the transparent layer against a mold die having a surface provided with projections/depressions of a two-dimensional periodic structure and thereby forming, at the upper surface of the transparent layer, projections/depressions in inverted relation to the projections/depressions of the mold die.